



Lamborghini
CALORECLIMA

AZIENDA CERTIFICATA ISO 9001:2000



CALDAIA A LEGNA - PELLET
ECOLOGICAL WATER-HEATING BOILERS
CHAUDIÈRES ÉCOLOGIQUES À EAU



PYROTHERM

30-35-50

LIBRETTO DI INSTALLAZIONE E MANUTENZIONE
INSTALLATION AND MAINTENANCE MANUAL
NOTICE D'INSTALLATION ET D'ENTRETIEN

Please read the instructions carefully as they provide important information about the safety, installation, use and maintenance of the boiler.
Keep the manual in a safe place for future consultation.
Installation must be carried out by qualified personnel in conformance with technical standards, the national and local laws in force, and the instructions in the manual provided with the equipment.



Congratulations...

... on your excellent choice.

And thank you for choosing our products.

LAMBORGHINI CALORECLIMA is daily committed to the search for innovation technical solutions that will meet all requirements. The constant presence of our products on the Italian and international markets is guaranteed by a widespread network of Agents and Dealers who are backed up by "LAMBORGHINI SERVICE", which ensures qualified equipment assistance and maintenance.

GUARANTEE

PYROTHERM boilers have a **SPECIFIC GUARANTEE** which begins from date on which it has been stamped by the Lamborghini Service in your area.

Please contact the above Service as quickly as possible. The boiler will be started up **FREE OF CHARGE** under the conditions specified in the **CERTIFICATE OF GUARANTEE** provided with the boiler, which we advise you to read carefully.

For the serial number, refer to the data plate on the boiler.

LAMBORGHINI CALOR S.p.A.

Bruno Marchesi
(General Manager)



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PURPOSE

The ecological water-heating boilers **PYROTHERM** are designed to warm family houses, offices, small production plants and other small and medium-sized accommodations.

The boilers are built exclusively for burning wood.

Almost any kind of dry wood with a maximum length of 500-750 mm, according to the type of boiler, can be used for the purpose.

Shavings, wood-fiber and other small chips can be burned in small quantities, up to 10%, but together with the bigger logs, (which are the main fuel).

CAUTION!

- The boilers are not designed for burning shavings and tiny wooden pieces.

TECHNICAL DATA

DESCRIPTION	PT 30	PT 35	PT 50	
Maximal heat capacity	30	34,8	48	kW
Range of the heat capacity	18-30	20-34,8	25-48	kW
Joining pipes to the heat conducting unit	G1 1/2"	G1 1/2"	G2"	
Volume of water in the boiler	70	90	110	l
Maximal permissible work pressure	200	200	200	kPa
Maximal permissible work temperature	90	90	90	°C
Min temperature of the flow-back boiler water	65	65	65	°C
Joining pipes to the serpentine	G1/2"	G1/2"	G1/2"	
Water pressure in the serpentine	200-400	200-400	200-400	kPa
Chimney diameter	152	152	152	mm
Necessary draught in the chimney	20-25	20-25	20-25	Pa
Fuel dry wood with calorificity	14-17	14-17	14-17	MJ/kg
maximal length of the logs	500	550	750	mm
optimal diameter of the logs	80-100	80-100	80-100	mm
water content	15-25	15-25	15-25	%
pellets	6-12	6-12	6-12	mm
Volume of the fuel container	110	130	170	l
Burning period at maximal heat capacity	3,5	3,5	3,5	h
Boiler class	3	3	3	mg/kWh
Efficiency	80-85	80-85	80-85	%
Electrical supply	220/50	220/50	220/50	V/Hz
Power consumed	41	41	80	W
Level of electric protection	20	20	20	IP
Maximum level of noise	65	65	65	dB
Dimensions length	1020	1100	1300	mm
width	680	680	680	mm
height	1350	1350	1350	mm
Boiler weight without water	290	320	380	kg



PACKAGING

Steel	1	piece
Rake	1	piece
Manual for installation and exploitation	1	piece
Paper of quality	1	piece
Warranty card	1	piece
HONEYWELL Braukmann – thermo regulator FR124	1	piece

CONSTRUCTION

The ecological water-heating boilers **PYROTHERM** are created for pyrolytic burning of logs, and, after the installation of the appropriate container, for pellets as well.

The boiler body is made of steel sheet iron that is 3-6 cm thick.

It consists of a fuel compartment that, in its lower part, has a ceramic nozzle with a longitudinal opening, through which the gases formed after burning pass.

Below is the burning section, where the wooden gases burn on a ceramic hearth.

The nozzle and the hearth are made of high quality ceramic material with working temperature up to 140 degrees.

The upper part of the body has an opening that serves as an entrance and exit to the serpentine, which acts as a coolant to prevent the boiler from overheating.

The body itself is isolated from the outside with mineral wadding, placed under the lids of the boiler.

The rear part of the boiler body has a vertical canal for the smoke; the upper part of this canal holds the ignition valve.

The rear part of the collective canal has a formed smoke pipe that connects with the chimney.

There is another canal in the rear part of the boiler, which carries the primary and secondary airflows, and a fan with a vent.

The primary and secondary airflows are pre-heated to reach a high temperature.

At the front upper part of the boiler is the door for fuel loading, and the lower part has door for cleaning the ashes.

When pellets are used, this door is to be replaced with a door for installing the pellet burner.

The upper part of the front lid contains the control panel, and on the right side of this lid is the handle for the ignition valve.

The control panel contains: a luminous net switch that turns the boiler on; a boiler thermostat which regulates the temperature at the exit of the boiler; thermo- and manometers that measure the temperature and pressure of the water at the exit of the boiler; thermostat for smoke gases – controls the temperatures of gases at the boiler's exit; signal lamp "ALARM" that lights when there is a problem with the boiler; an emergency thermostat – switches the boiler off when the water temperature exceeds 95 degrees Celsius; and a safety fuse – protects from a short circuit and overloading.

The rear part of the panel has a joint that connects the pellet burner with the boiler, and a switch that chooses a mode of operation.

The burning process of the pyrolysis goes through the following stages: when there are live coals at the bottom of the burning compartment, the logs that are on top of it are dried from above downwards by the pre-heated primary airflow supplied by the fan, thus causing a pyrolytic distillation of all flammable ingredients.

The formed wooden gas, after mixing with the preheated secondary airflow, burns in the nozzle and the burning compartment at very high temperature (over 100 degrees Celsius).

Such temperature ensures the burning of the fuel with almost no remains and a minimal content of harmful elements in the exhaust gases.

If the burning process goes as planned, the ash can be cleaned once in 5 days and be used as a fertilizer.

The operation and fine-tuning of the regimes of the pellet burner are described in detail in a separate manual for installation and exploitation.



INSTALLATION INSTRUCTIONS

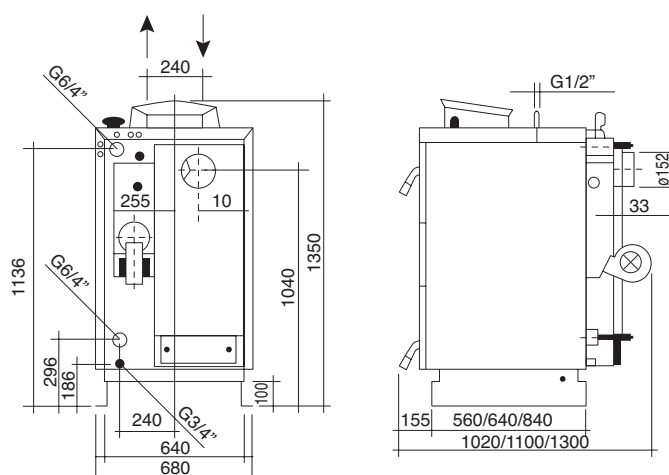
CAUTION!

- The installation and maintenance of pyrolytic boilers is done only by a specialized firm authorized to carry out such activities.
 - The installation of the boilers requires the preparation of a preliminary project that complies with the active norms and prescriptions.
 - The joining of the boiler with the heating installation is done only by a qualified technician.
 - When installing the boiler, one should raise its lower part by 10 mm.
-
- The boiler's construction allows its connection to a heating installation with a maximal work pressure of 200 kPa (2 bar) and a maximal temperature of the outgoing water of 95 degrees Celsius, with forced or gravitational circulation.
 - The installation must be done in a special room over a non-flammable material with a minimal height of 50 mm, and a constant access of air for burning must be present via an opening with a minimal area of 0,4 m² (20cm x 20cm).
 - The connection between the boiler and the chimney must also be made of non-flammable material, mechanically robust, reliably tight, with a diameter no less than the diameter of the chimney.
 - Its length should be no more than one meter and it should have an upward slope from the boiler to the chimney.
 - The joining dimensions of the exit and entrance to the heat installation can be seen on sketch 1.
 - The cricket under the entrance for the incoming water can be used for the installation of a tap or it can be blocked.
 - The tap serves for filling in or emptying the water from the boiler and the installation.
 - During the process of filling, the pressure of the water must not exceed 350 kPa.
 - It is recommended to connect the boiler to a system with a 4-way mixing valve, the purpose of which will be to maintain the temperature of the water in the boiler around 70 degrees Celsius.
 - If the client wishes, a pellet burner can be attached to the boilers with heat capacity of 25 and 32 kW.

If this is the case, here is what must be done:

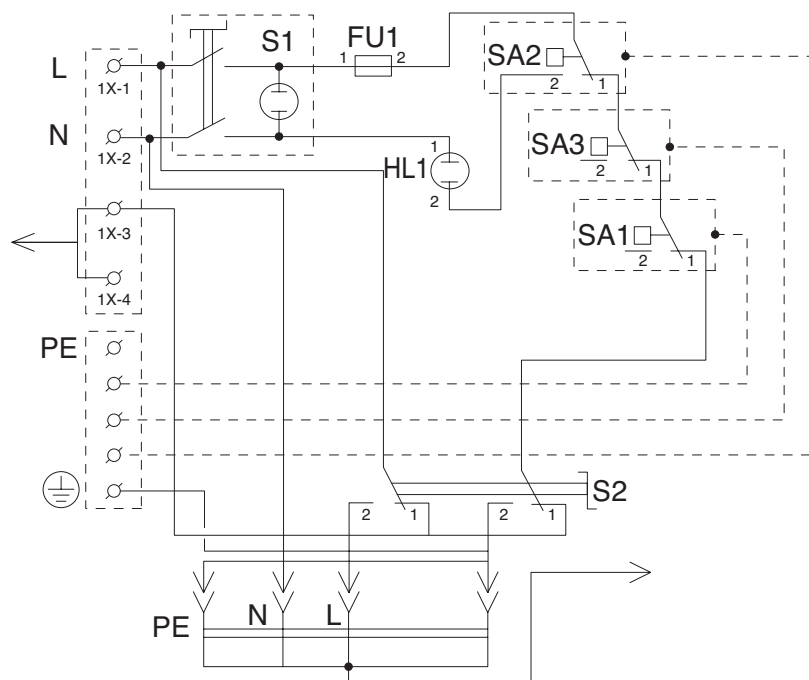
- 1) Remove the existing lower door.
 - 2) Install the door with an entrance to the pellet burner and regulation of the door's hinges.
 - 3) Install the pellet burner at the lower door.
- The burner is placed at the door entrance with the corresponding tightness.
It is attached with nuts, under one of which a **SPECIAL "L" - SHAPED METAL PART** is attached, which presses against the final switch, thus giving information that **THE BURNER IS INSTALLED**.
It is absolutely forbidden to eliminate this protection, as it is directly connected with fire safety measures.
 - When installing the burner, it must be heeded that the system is in proper position (leveled).
The hose must be stretched and the braces tight.
 - After the burner is mounted to the boiler, it must be plugged in the electric mains, according to the supplied diagram.
Special attention must be paid to the protective grounding of the installation.
 - The fuel transporter is connected to the burner by a special plug and contact, and is controlled by a specific algorithm (the burner has two contacts, CAUTION!)

THE LOWER CONTACT IS ALWAYS UNDER VOLTAGE AND SERVES FOR PRIMARY LOADING OF THE FUEL TRANSPORTER, and the other is for normal operation.





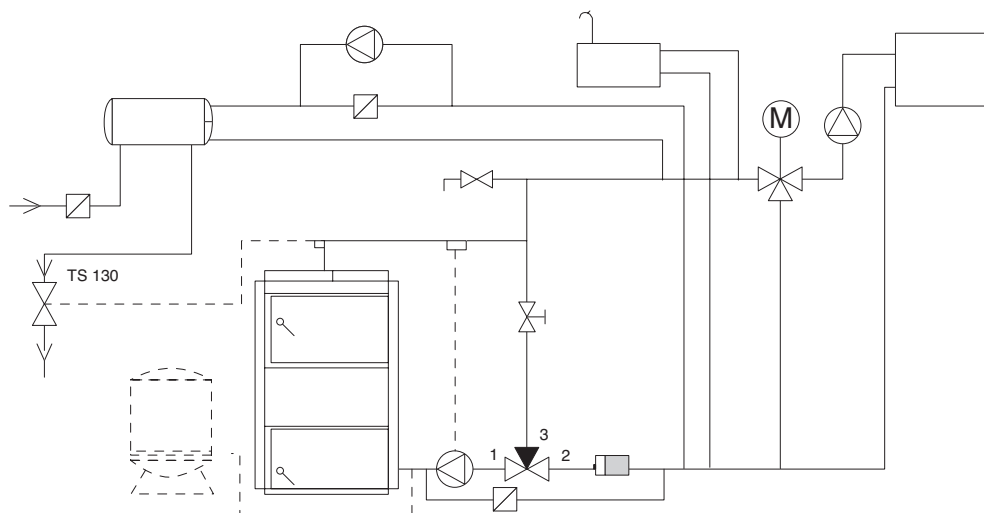
ELECTRIC DIAGRAM OF THE CONTROL PANEL



- | | | | |
|------------|---|------------|------------------------------|
| FU1 | safety device | SA2 | failure thermostat |
| S1 | luminous net switch "POWER" | SA3 | thermostat for exhaust gases |
| S2 | switch for mode selection "Pellet burner" | HL1 | signal lamp "ALARM" |
| SA1 | boiler thermostat "Thermostat-B" | | |

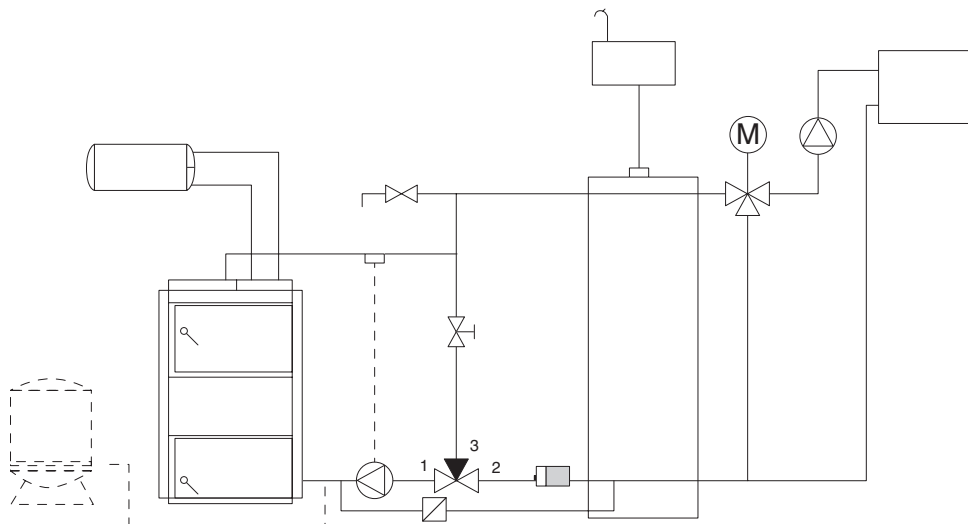
CONNECTING DIAGRAMS

RECOMMENDED DIAGRAM FOR CONNECTING THE BOILER WITH A THERMO-REGULATING VALVE

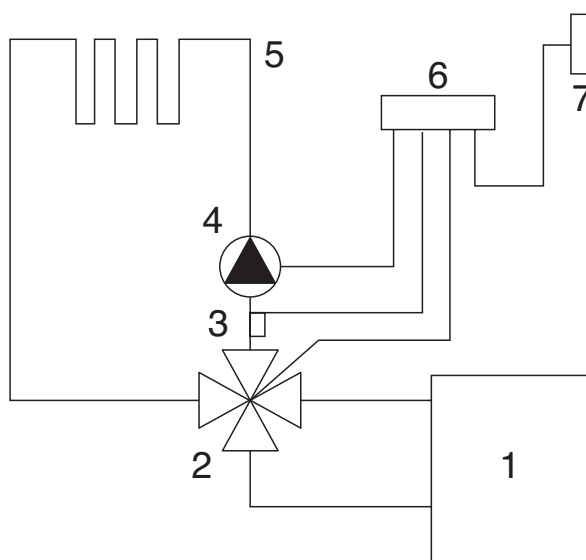




RECOMMENDED DIAGRAM FOR CONNECTING THE BOILER WITH AN ACCUMULATING VESSEL



RECOMMENDED CONNECTION OF THE BOILER WITH A 4-WAY VALVE

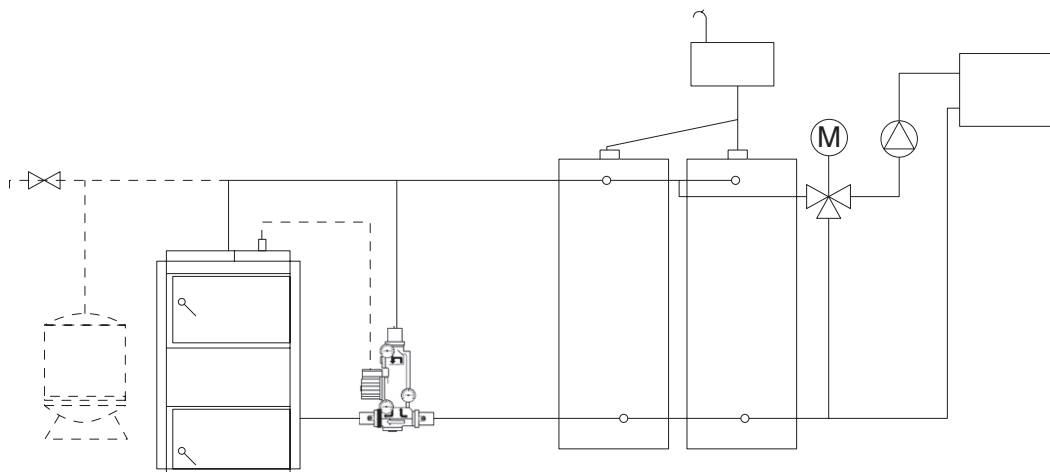


- 1 boiler
- 2 4-way mixing valve
- 3 temperature sensor
- 4 circulation pump

- 5 heating system
- 6 regulator
- 7 temperature sensor

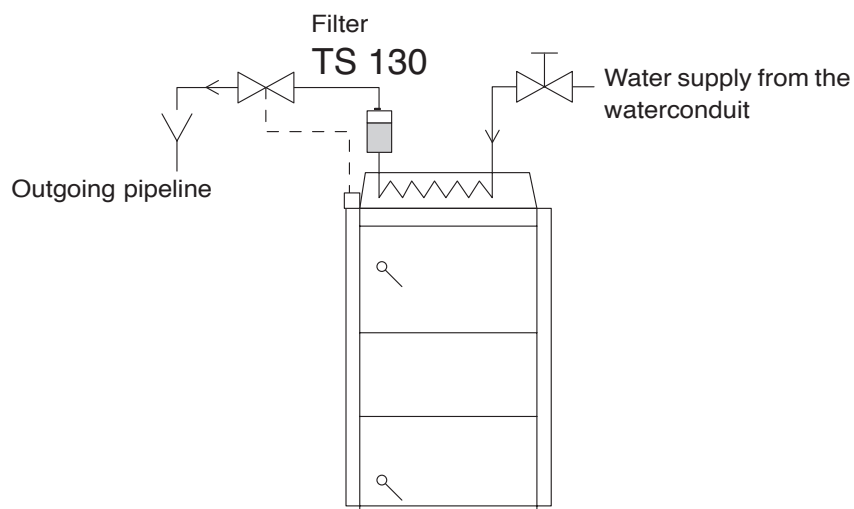


RECOMMENDED SCHEME FOR CONNECTION WITH A SPECIAL CONTROL VALVE BLOCK AND ACCUMULATING VESSEL



PROTECTION OF THE BOILER FROM OVERHEATING

Boiler with a coolant and a safety valve regulated by temperature Honeywell TS 130-3/4 A (temperature of opening the valve 95 degrees)





EXPLOITATION INSTRUCTIONS

CAUTION!

- Pyrolitic boilers are brought into exploitation only by a specialized firm authorized to carry out such activity.

Before starting to use the boiler, the following things have to be checked:

a) the heat system must be filled with water;

The water used for filling the boiler and the heat system must be transparent, colorless, without sediments, oil and aggressive chemical additives.

Its solidity must correspond to the accepted norms. If this is not the case, the water must be softened.

In case of non-compliance with these requirements, if a defect on the boiler heating surface appears, the company does not take any responsibility.

General solidity	30	mg.eq/kg
Oxygen	100	mg/kg
Free sulphide	2	mg/kg
Oil and heavy petroleum products	3	mg/kg
pH	8 ÷ 9,5	
Salt content	600	mg/kg
Total alkalence	30	mg/kg
Free CO ₂ content		

For systems, in which the water is in contact with copper (e.g. systems that have copper pipes) the value of the water's pH must not be greater than 10.

The heat systems with open expansive vessel allow immediate contact between the water and the atmosphere.

During the heating season, the water in the in the open expansive vessel absorbs oxygen, which increases its corrosive activity and also activates the process of the water's evaporation. Only water that complies with the above-listed parameters can be used for filling up. During the heating season it is necessary to maintain a constant volume of water in the heat system.

When necessary, the heat system is filled up with water, but only if the boiler has cooled down.

This is very important, as it prevents damage of the steel heat transfer unit.

When filling up with water, one must be cautious not to allow any air penetration in the system.

The water is only used for the specified purpose.

It is inadmissible to pump the water out of the boiler and the system, except in cases of reparation.

b) Tightness of the heat system

c) Connection with the chimney

d) Contact with the electric mains (mains supply)

CAUTION!

- Only adults, physically and mentally healthy, who have acquainted themselves in advance with the manual for exploitation, must service the boilers. The presence of children without supervision from adults near the boiler is not admitted, especially when it is in operation.
- In case of danger of volatile fumes and gases penetrating the boiler room, or when activities that can lead to fire or explosion (e.g. gluing floor covers, polishing with flammable paint, etc.), the boiler's operation must be stopped.
- The ignition process excludes the use of any flammable liquids.
- All manipulations that can lead to overheating the boiler during its operation are prohibited.
- It is forbidden to place flammable materials in the proximity of the boiler, or at a distance less than the safety recommendations.
- When removing the ash, the presence of flammable materials is allowed within distance of at least 1500 mm. The ash is poured into a fire resistant container with a lid.
- The exploitation of boilers with temperatures less than 60 degrees Celsius causes dew on the steel heat transfer cover and leads to low-temperature corrosion, which shortens the life of the boiler. To avoid this condition, the boiler must operate at temperature of 60 degrees or higher.
- After the end of the heating season, the boiler and the chimney are cleaned thoroughly. The boiler room must also be clean and dry.
- Any manipulations on the electric installation of the boiler are prohibited.

IGNITION

We plug the boiler in the electric mains via a power cable.

The ignition valve and the upper door are opened and we put dry splinters over the fire-resistant forms perpendicular to the nozzle, so that there is a 2-3 cm distance between them (the splinters do not block the nozzle).

Paper, splinters and logs are placed on top of them, we light the fire and wait for the wood to start burning, then we add more logs and, after these have are aflame as well, we close the door of the upper fuel compartment, close the ignition valve and switch the fan on from the control panel.

The boiler thermostat is adjusted at 80 degrees.

After about 30 minutes there is a layer of live coals on the ceramic plate that is thick enough for the purpose of the normal boiler operation, therefore we can fill the whole chamber with fuel.

CAUTION!

- During operation, it is not permitted to open the door of the upper chamber when the fan is on and the ignition valve is closed.

FILLING UP WITH FUEL

Before every fill-up with fuel we have to: first, we have to switch the fan off; secondly, we open the ignition valve; thirdly, we open and leave ajar the door of the upper fuel chamber and hold it this way for 20 seconds or so till the gases have been pulled away through the chimney, and then open it fully.

Fuel is poured till the chamber is full, the door and the ignition valve are closed and the fan is turned on.

When filling up with fuel the following sequence must be kept:

1. The burning material must be placed in a longitudinal manner over the chamber nozzle, and in a way such that none of the splinters get stuck in it.
2. Special attention must be paid not to block the closing of the ignition valve.
3. When we fill up with big logs and small wooden splinters, the latter must be placed at the end of the chamber/compartment, and the big and moist ones - in the middle.

This is done to prevent forming a cavity over the nozzle.

MODES OF OPERATION

Optimal mode of operation

The optimal mode of work of the boiler is achieved when the temperature of the outgoing water is above 75 degrees.

If this temperature is lower, and especially when this value is less than 60 degrees, there is a partial distillation, formation of tar and condensation, which prevent the boiler from proper operation.

If the boiler is installed in a room with forced circulation, the pump's operation must be coordinated with the temperature of the outgoing water, i.e. the pump must switch itself on when this temperature exceeds 70 degrees.

Air

The air enters the boiler via the fan where it is heated and distributed as primary and secondary flows.

The heated primary flow enters the fuel chamber, where it dries the fuel, causes pyrolytic distillation and thus the wooden gas is formed.

The secondary airflow, also heated, is passed in the ignition nozzle, mixes with the wooden gas and ensures the full burning of all flammable ingredients.

The air valve does the division and regulation of the primary and secondary airflows.

It is produced from the factory at 33 mm (see page 22) and fixed with screw M5.

To increase the primary and, respectively, reduce the secondary airflow, it is necessary to loosen screw M5 and push the air valve at a distance less than 33 mm.

CAUTION!

- The adjustment of the air valve should only be done by a qualified technician, and within 2-3 mm margin.

Fuel

The power and duration of the burning depend on the quality of the wooden material.

Oak, beech, ash-tree, sycamore and the fruit trees are the best quality wood for burning.

Chestnut-trees, birch and pine spruce are second in quality, and elm-trees, lime-trees, poplar and willow are of the lowest quality.

The resin material has medium to low quality and can cause serious staining of the chamber with tar.

The fresh wooden material warms little, burns badly, produces a lot of smoke and shortens the life of the boiler.

The boiler's efficiency can drop to 50 % and the fuel consumption increases twofold when such material is used.

For example:

- Wood with humidity 20% has a calorific value of 4kWh/kg.
- Wood with humidity 50 % has a calorific value of 2kWh/kg.

Regulating the burning process

The flame that comes out of the ignition valve and is directed downwards, when approaching the operational temperature of the boiler (minimum 70 degrees), has to reach the ceramic fireplace in the burning chamber and it has to have a bluish color without any smoke.

If this is not the case, but rather it has:

- a strong red color with smoke – then, the secondary airflow must be increased and the primary one reduced.
- a small, weak flame – then, we should increase the primary airflow and reduce the secondary one.

With proper burning, the ceramic surface of the burning chamber has to be white or light gray and dry, and the quantity of the formed ash - small.

Boiler's mode of operation with pellet burner

- the coupling of the burner must be connected with the jaw-clutch placed on the rear part of the electric panel
- the key that selects the various modes should be put into position "Pellet burner"
- the valve of the fan for exhaust gases should be tightly shut.

The operation of the pellet burner is described in detail in its own manual for installation and exploitation.

Mode "heat reserve"

This mode allows for maximum reduction in capacity, thus reducing the fuel consumption, while the boiler is ready to switch to full capacity.

We enter this mode by turning the fan off and filling up with fuel.

The duration of this regime ranges from 12 to 17 hours.

From this mode, when switching the fan on, the boiler reaches full heat capacity in just a few minutes.

It is necessary to fill up with fuel again.

Mode "Failure"

In case the maximum allowed temperature of the water (95 degrees) is exceeded, the emergency thermostat shuts the fan down and the red signal lamp turns on.

This situation arises mostly in the transitional period, when the consumption of the heating energy is low, the boiler thermostat is set to maximal temperature and the fuel is of high quality.

To shift to normal operation mode, it is necessary first to eliminate the cause that activated the failure thermostat, after which the temperature in the boiler should decrease to 80 degrees and then the normal state of the failure thermostat will be restored.

CLEANING THE BOILER

Cleaning the boiler begins by switching off the fan. It must be done periodically and thoroughly every 3 to 5 days, since the ash that has accumulated in the fuel chamber, as well as the condensations and the tar reduce significantly the average life expectancy and capacity of the boiler, and also isolate the surface that conducts heat.

When the ash is in bigger quantities, there is no space for burning the fuel completely, which can cause damage to the boiler.

Fuel chamber

After operation of the boiler, a layer of tar is formed in the fuel chamber, which must be removed - this cover isolates the heat and acts corrosively.

The tar removal is done only on the metal walls. It is gathered in the middle of the bottom, where it will burn from the high temperature.

Burning chamber

The ash in the burning chamber that lies on the bottom over the ceramic fireplace must be cleaned with the rake always when the thickness of the layer exceeds 5 cm.

Heat transfer unit

The two "winged" M8 screws have to be loosened and the top lid is removed.

After that, the two wave-shaped bars are taken out and the tar and soot are scrubbed away from the metal walls with the wire brush.

The accumulated soot and tar are taken out through the lower rear lid.

Air chamber

Once each month the fan and the round lid on top of it are removed.

Through the lid entrance we poke and clean the metal surfaces and through the fan hole the leftovers are taken away.

CAUTION!

- The regular and thorough cleaning is vital for securing a lasting capacity and long life of the boiler.
- If the cleaning has not been properly carried out, damage to the boiler can occur, in which case the warranty is void.

BRUCIATORI
CALDAIE MURALI E TERRA A GAS
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GENERATORI DI ARIA CALDA
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